CLAIMS

1. A latex, obtainable by reacting

A) 30-90% by weight of at least one ethylenically unsaturated monomer;

B) 70-10% by weight of a diene;

C) 1-10% by weight of α,β-unsaturated carboxylic acids, carboxylic acid nitriles, carboxylic acid amides, or mixtures thereof; and

D) at least one auxiliary, at least one additive or mixtures thereof;

wherein a sum of A, B and C is 100% by weight;

wherein said reacting follows a gradient regime for components A and B;

wherein, in said gradient regime, an amount added per unit time of one of components A or B continuously increases, while simultaneously an amount added per unit time continuously decreases for one of components A or B which does not undergo the continuous increase;

with the proviso that a starting molar ratio of A to B is adjusted from a range of 0.15 - 0.95 or 1.05 - 6.66 through at least one discontinuous change in the amount added per unit time to a target molar ratio of A to B, in the range of 1.05 – 6.66 or 0.15 – 0.95, and thereafter the change in the amount added per unit time is made

i) constantly for A and B, and/or

ii) decreasingly for A and ascendingly for B, and/or

iii) decreasingly for B and ascendingly for A,

in any sequence, individually or in combination.

2. The latex as claimed in claim 1, wherein component A is selected from the group consisting of C_2 to C_{20} alkenes, functionalized vinyl compounds, C_5 to C_{20} alkadienes having isolated double bonds, C_5 to C_{20} alkatrienes having isolated double bonds, C_5 to C_{20} cycloolefins, vinyl-substituted aromatics, α,β-monoethylenically unsaturated carboxylic

acids, nitriles of α,β-monoethylenically unsaturated carboxylic acids, amides of α,β-monoethylenically unsaturated carboxylic acids, anhydrides of α,β-monoethylenically unsaturated carboxylic acids, C_1 to C_{20} alkyl esters of acrylic acid, C_1 to C_{20} alkyl esters of methacrylic acid, C_6 to C_{20} aryl esters of acrylic acid and C_6 to C_{20} aryl esters of methacrylic acid.

3. The latex as claimed in claim 2, wherein component A comprises vinylaromatics.

4. The latex as claimed in claim 3, wherein component A comprises styrene.

5. The latex as claimed in claim 1, wherein component B is selected from the group consisting of C_4 to C_{20} dienes having conjugated double bonds.

6. The latex as claimed in claim 1, wherein component B comprises butadiene.

7. The latex as claimed in claim 1, wherein component C is selected from the group consisting of C_3 to C_6 α,β-monoethylenically unsaturated monocarboxylic acids, C_3 to C_6 α,β-monoethylenically unsaturated dicarboxylic acids, esters of C_3 to C_6 α,β-monoethylenically unsaturated monocarboxylic acids with C_1 to C_{12} alkanols, esters of C_3 to C_6 α,β-monoethylenically unsaturated dicarboxylic acids with C_1 to C_{12} alkanols, amides of C_3 to C_6 α,β-monoethylenically unsaturated monocarboxylic acids, amides of C_3 to C_6 α,β-monoethylenically unsaturated dicarboxylic acids, nitriles of C_3 to C_6 α,β-monoethylenically unsaturated monocarboxylic acids, nitriles of C_3 to C_6 α,β-monoethylenically unsaturated dicarboxylic acids, anhydrides of C_3 to C_6 α,β-monoethylenically unsaturated monocarboxylic acids, and anhydrides of C_3 to C_6 α,β-monoethylenically unsaturated dicarboxylic acids.

8. The latex as claimed in claim 1, wherein component C comprises acrylic acid, acrylonitrile, acrylamide, methacrylic acid, itaconic acid or mixtures thereof.

9. The latex as claimed in claim 1, wherein at least one of components D is selected from the group consisting of surface-active substances, initiators, molecular weight regulators, pH regulators, complexing agents, and mixtures thereof.

10. The latex as claimed in claim 1, wherein before the beginning of said gradient regime a portion of components A and B is metered in with constant linearity.

11. The latex as claimed in claim 1, wherein, before said starting molar ratio of A to B or said target molar ratio of A to B is reached, the gradient regime operates without or with single or multiple reversal of a change in the amount added per unit time of A and B.

12. The latex as claimed in claim 1, wherein there are two, three or four discontinuous changes in the amount added per unit time.

13. The latex as claimed in claim 1, wherein said reacting takes place at a temperature of from 5 to 130°C; and

wherein said temperature is constant during said reacting; or

wherein said temperature varies during said reacting.

14. The latex as claimed in claim 1, wherein component C is run in with a constant and/or with a decreasing and/or an increasing change in the amount added per unit time and any desired combinations thereof and dependently or independently of the amount added per unit time of components A and B .

15. The latex as claimed in claim 1, wherein component D is run in with a constant and/or with a decreasing and/or an increasing change in the amount added per unit time and any desired combinations thereof and dependently or independently of the amount of components A and B added per unit time.

16. A process for preparing a latex, comprising:

reacting

A) 30-90% by weight of at least one ethylenically unsaturated monomer;

B) 70-10% by weight of a diene;

C) 1-10% by weight of α,β-unsaturated carboxylic acids, carboxylic acid nitriles, carboxylic acid amides, or mixtures thereof; and

D) at least one auxiliary, at least one additive or mixtures thereof;

wherein a sum of A, B and C is 100% by weight;

wherein said reacting follows a gradient regime for components A and B;

wherein, in said gradient regime, an amount added per unit time of one of components A or B continuously increases, while simultaneously an amount added per unit time continuously decreases for one of components A or B which does not undergo the continuous increase;

with the proviso that a starting molar ratio of A to B is adjusted from a range of 0.15 - 0.95 or 1.05 - 6.66 through at least one discontinuous change in the amount added per unit time to a target molar ratio of A to B, in the range of 1.05 – 6.66 or 0.15 – 0.95, and thereafter the change in the amount added per unit time is made

i) constantly for A and B, and/or

ii) decreasingly for A and ascendingly for B, and/or

iii) decreasingly for B and ascendingly for A,

in any sequence, individually or in combination.

17. The process according to claim 16, wherein component A is selected from the group consisting of C_2 to C_{20} alkenes, functionalized vinyl compounds, C_5 to C_{20} alkadienes having isolated double bonds, C_5 to C_{20} alkatrienes having isolated double bonds, C_5 to C_{20} cycloolefins, vinyl-substituted aromatics, α,β-monoethylenically unsaturated carboxylic acids, nitriles of α,β-monoethylenically unsaturated carboxylic acids, amides of α,β-monoethylenically unsaturated carboxylic acids, anhydrides of α,β-monoethylenically unsaturated carboxylic acids, C_1 to C_{20} alkyl esters of acrylic acid, C_1 to C_{20} alkyl esters of

methacrylic acid, C_6 to C_{20} aryl esters of acrylic acid and C_6 to C_{20} aryl esters of methacrylic acid.

18. The process according to claim 16, wherein component A comprises vinylaromatics.

19. The process according to claim 16, wherein component A comprises styrene.

20. The process according to claim 16, wherein component B is selected from the group consisting of C_4 to C_{20} dienes having conjugated double bonds.

21. The process according to claim 16, wherein component B comprises butadiene.

22. The process according to claim 16, wherein component C is selected from the group consisting of C_3 to C_6 α,β-monoethylenically unsaturated monocarboxylic acids, C_3 to C_6 α,β-monoethylenically unsaturated dicarboxylic acids, esters of C_3 to C_6 α,β-monoethylenically unsaturated monocarboxylic acids with C_1 to C_{12} alkanols, esters of C_3 to C_6 α,β-monoethylenically unsaturated dicarboxylic acids with C_1 to C_{12} alkanols, amides of C_3 to C_6 α,β-monoethylenically unsaturated monocarboxylic acids, amides of C_3 to C_6 α,β-monoethylenically unsaturated dicarboxylic acids, nitriles of C_3 to C_6 α,β-monoethylenically unsaturated monocarboxylic acids, nitriles of C_3 to C_6 α,β-monoethylenically unsaturated dicarboxylic acids, anhydrides of C_3 to C_6 α,β-monoethylenically unsaturated monocarboxylic acids, and anhydrides of C_3 to C_6 α,β-monoethylenically unsaturated dicarboxylic acids.

23. The process according to claim 16, wherein component C comprises acrylic acid, acrylonitrile, acrylamide, methacrylic acid, itaconic acid or mixtures thereof.

24. The process according to claim 16, wherein at least one of component D is selected from the group consisting of surface-active substances, initiators, molecular weight regulators, pH regulators, complexing agents, and mixtures thereof.

25. The process according to claim 16, wherein said reacting takes place at a temperature of from 5 to 130°C.

26. An article coated with the latex according to claim 1.